RESEARCH REPORT DOCUMENTATION PAGE

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5. Title and Subtitle

Evaluation Of Portland Cement Concrete As A Rehabilitation Option For Overlaying An Existing Asphalt Roadway.

6. Report Type

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Evaluation ☒
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11. Author(s)/Principle Investigator(s)

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12. Performing Organization Name and Address

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NDDOT OTHER* ☐
NDSU ☐
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UGPTI ☐
OTHER* ☐
*see supplementary notes

North Dakota DOT
Materials and Research Division
300 Airport Road
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13. Sponsoring Agency Name and Address

North Dakota DOT
Materials and Research Division
300 Airport Road
Bismarck ND 58504-6005

14. Supplementary Notes

15. Abstract

Purpose and Need

Whitetopping is the process of placing concrete on an existing asphalt roadway. An advantage of whitetopping is the ability to resist rutting and shoving that can cause collection of water on the roadway. Whitetopping impedes structural related distresses such as loss of support, pumping, faulting and corner breaks when constructed on a strong base. Another advantage of this process is to bridge isolated problems that would be reflected through a flexible pavement.

The concept behind whitetopping is that when PCC is bonded to an underlying layer of asphalt, the two form a composite layer forcing the neutral axis in the slab downward. This would cause more of the concrete to be acting in compression rather than tension.

Whitetopping has not been a rehabilitation method used by the North Dakota Department of Transportation in the past.

Objective

The objective of this experimental feature is to determine if whitetopping is a feasible option for rehabilitation of an asphalt roadway.

Scope

In order to determine the effectiveness of whitetopping as possible rehabilitation technique, the North Dakota Department of Transportation (NDDOT) elected to set up a test section to collect and evaluate performance data on this type of project. The NDDOT has constructed three test sections of 5", 6", and 7" of PCC to be placed over an existing asphalt section. Each whitetopping test section was approximately 500' in length.

The project is located on US Highway 52 between Pingree and Buchanan, ND. The project will be evaluated on visual distresses and ride for a period of ten-years with reports every two-years.

Summary

Test sections 1 and 3 are showing the most distresses. The primary distress is longitudinal cracking. Test sections 1 and 3 are adjacent to hot bituminous pavement sections. Test section 1 had a 40' longitudinal crack that appeared immediately after construction. Test section 2 is performing well with only minor distresses. The control section is performing well with minor rutting and two transverse cracks.

The longitudinal cracking in test sections 1 and 3 are likely the result of poor subgrade conditions. The location of the longitudinal cracks is in the same area as the distresses shown in photo 1 prior to whitetopping the asphalt. These distresses appeared to have reflected through the whitetopping sections. The ride remains good in all sections.

16. Key Words

Pavement Concrete
Overlays
Whitetopping

17. Distribution Statement

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